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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

FARAHANI, DANA

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 01/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/921,948

Applicant(s)

VIOLETTE, MICHAEL

Examiner

Dana Farahani

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 November 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10-41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10-41 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 10-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view of Grubisich et al., hereinafter Grubisich (U.S. Patent 5,698,459), both previously cited.

Regarding claims 10, 13, 16, 17-20, 23-29, and 34-41, AAPA discloses in figure 2 a transistor formed in a semiconductor substrate (not shown), the transistor comprising a collector region, shown as an N well, having an impurity therein, extending downward from the surface of the substrate; a base region, shown as BASE, having an impurity therein and extending downward from the surface of the substrate into contact with a portion of the collector; an emitter, shown as EMITTER, on top of the base region with smaller area than the base region; a second implant region in the middle of the plug shown as N+ COLL TAP, in the collector region, about the same level from the surface of the substrate as the first implant; and an implant area, shown as LOCAL IMPLANT, of the collector region, vertically adjacent to the base region, the implant area having an effective surface area greater than the surface area of the emitter and less than the surface area of the base region.

AAPA does not expressly disclose the implant area has an increased collector doping.

Grubisich discloses in figure 3a implant area 88, along a collector base junction, with an increased collector doping. Grubisich further discloses that area 88 provides the transistor with improved performance characteristics due to its additional doping (see column 10, lines 31-46). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to increase the doping of the implant area in AAPA to improve the performance characteristics of the transistor.

Regarding claims 11, 12, 14, 15, 21, 22, and 31, Grubisich discloses in column 12, lines 31-34 that phosphorus and boron are used for n-type and p-type doping of the transistor device of his invention. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use these materials in order to take advantage their particular diffusion rates which might be desirable during the fabrication process of the device.

Regarding claims 30, 32, and 33, AAPA in view of Grubisich renders obvious the claimed invention, as above discussed. Grubisich also discloses the substrate 60 of figure 3a is of a second conductivity type, and the collector 86 is of a first conductivity type. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use this doping configuration in order to make a transistor with improved characteristics such as improved breakdown voltage, as Grubisich teaches (see the abstract and columns 5, 6, and column 7, lines 1-21).

Product-by-Process Limitations

While not objectionable, the Office reminds Applicant that “product by process” limitations in claims drawn to structure are directed to the product, per se, no matter how actually made. *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also, *In re Brown*, 173 USPQ 685; *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324; *In re Avery*, 186 USPQ 161; *In re Wethheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); *In re Marosi et al.*, 218 USPQ 289; and particularly *In re Thorpe*, 227 USPQ 964, all of which make it clear that it is the patentability of the final product per se which must be determined in a “product by process” claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in “product by process” claims or otherwise. Note that applicant has the burden of proof in such cases, as the above case law makes clear. Thus, no patentable weight will be given to those process steps which do not add structural limitations to the final product.

For example, in claims 36 and 37, the implant regions being simultaneously formed by an angled implant, or by a same source, are considered methods of forming those regions and not limitations of the final product. Therefore, such limitations are given no patentable weight.

Response to Arguments

3. Applicant's arguments filed on 1/22/02 have been fully considered but they are not persuasive.

In regard to applicant's argument that figure 2 of the present application does not show a second implant region in the middle of the plug, note that N+ COLL TAP inherently includes a region in the middle thereof (that is a sub-region of the plug) smaller than the plug. Of course that region is not separated from the plug, but it is included in the plug, and has the same doping and conductivity as the plug. Further, note that the sub-region, for example a narrow strip in the middle of the plug, distinguishes from the plug, since the plug and the strip region are not the same thing. The only limitation imposed on the strip region is being a sub-region of the plug, that is a region entirely included in the plug.

In response to applicant's argument that Fig. 2 of the present application does not show the implant area labeled LOCAL IMPLANT, the examiner notes that there is, in fact, an area labeled LOCAL IMPLANT at the front end of the arrows shown in the figure. Furthermore, this area does not have the same area as emitter. The examiner has measured the local implant area and the emitter, and it appears that they both have the same length, but LOCAL IMPLANT area is wider (from top to the bottom) than the emitter. Therefore, the surface area of the LOCAL IMPLANT area is greater than the emitter area, and obviously, smaller than the base region, as can clearly be seen in the figure.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dana Farahani whose telephone number is (703)305-1914. The examiner can normally be reached on M-F 9:00AM - 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703)308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9318 for regular communications and (703)872-9319 for After Final communications.

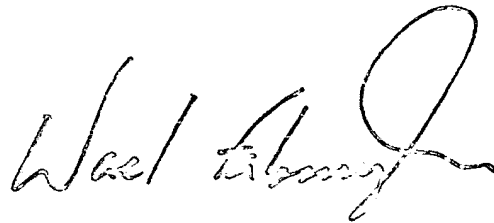
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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Dana Farahani
January 28, 2003

A handwritten signature in black ink, appearing to read "Wael Alamy". The signature is fluid and cursive, with a large loop at the end.

SUPERVISORY PRINCIPAL ENGINEER
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